

Making Communities Safer

**Oakland Privacy Advisory Commission
June 6, 2019**



 **ShotSpotter®**

Gun violence is an epidemic in the US

ON AVERAGE
THERE ARE NEARLY

14,000

GUN HOMICIDES A YEAR
IN THE UNITED STATES



FOR EVERY **ONE** PERSON
KILLED WITH GUNS,
SIX MORE ARE INJURED

Source: CDC,
Everytown.org

80% of gunshot incidents are NEVER reported to 911



**Why Don't More
People Call?**

**Recognition
Redundancy
Retaliation
Resignation**

WHEN THEY DO CALL, THE DATA IS LATE, INACCURATE, AND INCOMPLETE

Source: Brookings Institute

A photograph of a crime scene. Yellow police tape is stretched across the middle of the frame. In the foreground, a woman on the left wears a black jacket and a colorful striped beanie. Next to her, a woman in a red puffer jacket and glasses looks towards the camera. In front of her, a young boy in a black jacket looks down. The background is blurred, showing other people and a white pillar.

What's the cost of a 20% response rate with a delayed response and imprecise location data?

Shooting Victims Die

Evidence Not Collected

Criminals Get Away

Community Thinks Police Don't Care

PERSISTENT GUNFIRE BECOMES "NORMAL"



 **ShotSpotter**

**The leader in gunfire detection,
location & forensic analysis**

ShotSpotter Overview

ShotSpotter (NASDAQ: SSTI) is the leading provider of **gunfire detection solutions** helping law enforcement identify, locate, and deter gun violence.

100

Cities deployed in

670

Square miles under contract

23

Years in business



>12M

Incidents Reviewed

94%

Customer Satisfaction

Our Purpose

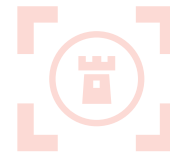
“Earn the trust of law enforcement to help them provide equal protection to all and strengthen the police-community relationship, ultimately reducing gun violence”



DETECT gunfire for rapid and precise response



DETECT



PROTECT



CONNECT

Dot on Map Gunshot Location in <60 seconds

794 Green St
Metropolis A

DETAILS

Today 08:42:08 Area: /Beat 3
CAD: 17-238759 Incident: 9900-70035

STREET VIEW

794 Green St

AUDIO

0 secs

COMMENTS

MOST RECENT

a few seconds ago
Modified CAD to 17-238759

Google email support@shotspotter.com

Map data ©2017 Google Imagery ©2017 DigitalGlobe, U.S. Geological Survey | Terms of Use | Report a map error

794 Green St
Metropolis A

an hour ago

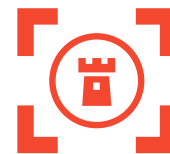
ShotSpotter®

ZOOM OUT ZOOM IN CLOSE UP

PROTECT officers with increased tactical awareness



DETECT



PROTECT



CONNECT

3002 Champa St

Metropolis

DETAILS

Today 16:17:20

CAD:

Area: 2/211

Incident: 9720-5150

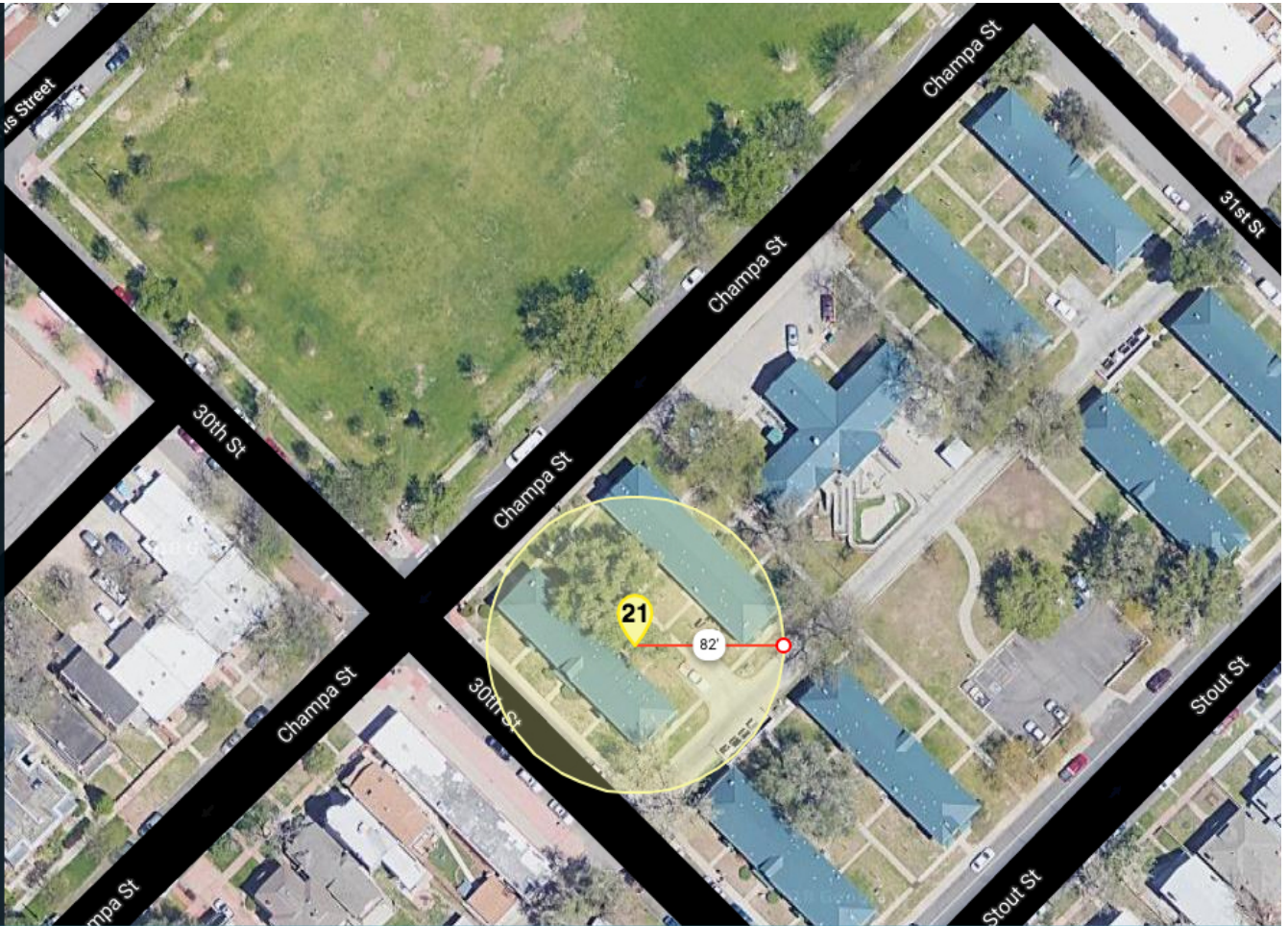
Full Auto*

Multiple Shooter*

REPORT

STREET VIEW

AUDIO



DETAILS

3002 Champa St

Metropolis

21

8 minutes ago

ZOOM OUT

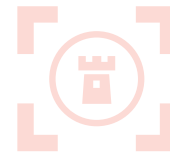
ZOOM IN

MULTIPLE

CONNECT police to evidence and the community



DETECT



PROTECT

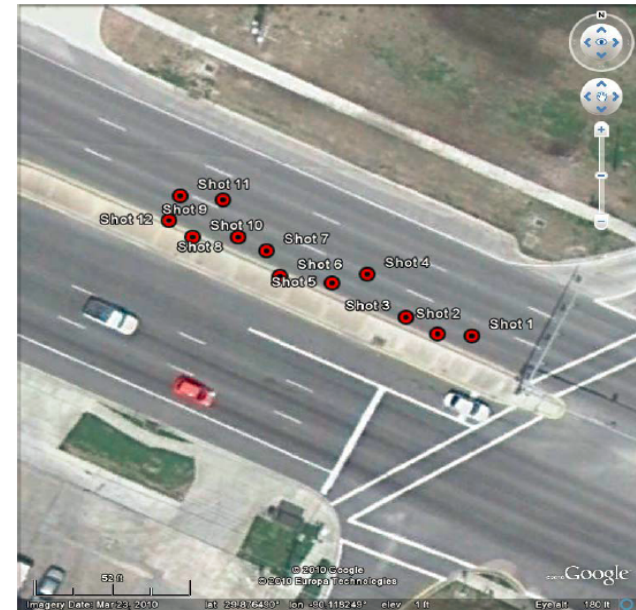


CONNECT

Crime Scene Investigation Tool

Investigative Lead Summary (ILS):

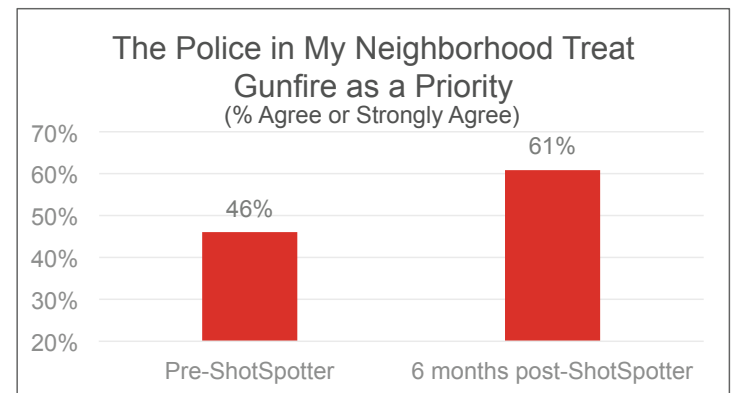
Provides approximate location, sequence and timing of each shot fired for better evidence collection and interviewing of witnesses/suspects on scene; available on demand from Respond app. For investigative purposes only.



Investigative Lead Summary

Enhanced Police-Community Relations

Consistent response to gunfire incidents helps police connect with communities they serve



Source: Cincinnati PD 2018

Sample of Positive Outcomes as Part of Comprehensive Gun Crime Response Strategy

Oakland, CA

66%

reduction in
shootings per mile²

[\[READ MORE \]](#)

Cincinnati, OH

48%

reduction in
shooting victims

[\[READ MORE \]](#)

Chicago, IL

40%

reduction in
Englewood shootings

[\[READ MORE \]](#)

Denver, CO

102

arrests made with the
help of ShotSpotter

[\[READ MORE \]](#)

Sacramento, CA

3,635

positive contacts with the
community

[\[READ MORE \]](#)

Las Vegas, NV

342

gunfire incidents identified by
ShotSpotter with no 911 call in 9
months

[\[READ MORE \]](#)

Camden County, NJ

46%

decrease in homicides
by shootings

[\[READ MORE \]](#)

Bakersfield, CA

22

22 arrests in first 9 months of
deployment

[\[READ MORE \]](#)

Rochester, NY

40%

decrease in gunshot
incidents

[\[READ MORE \]](#)

ShotSpotter Impact on Patient Outcomes

4 min.

Time saved transporting GSW victims to hospital from ShotSpotter coverage area

35%

Reduction in field interventions for GSW victims in ShotSpotter coverage areas

"ShotSpotter has developed technology that allows the trauma patient who has been shot to get to me faster, so I have a greater chance of saving their lives."

John Porter, M.D. Chief of Surgery
Cooper Health

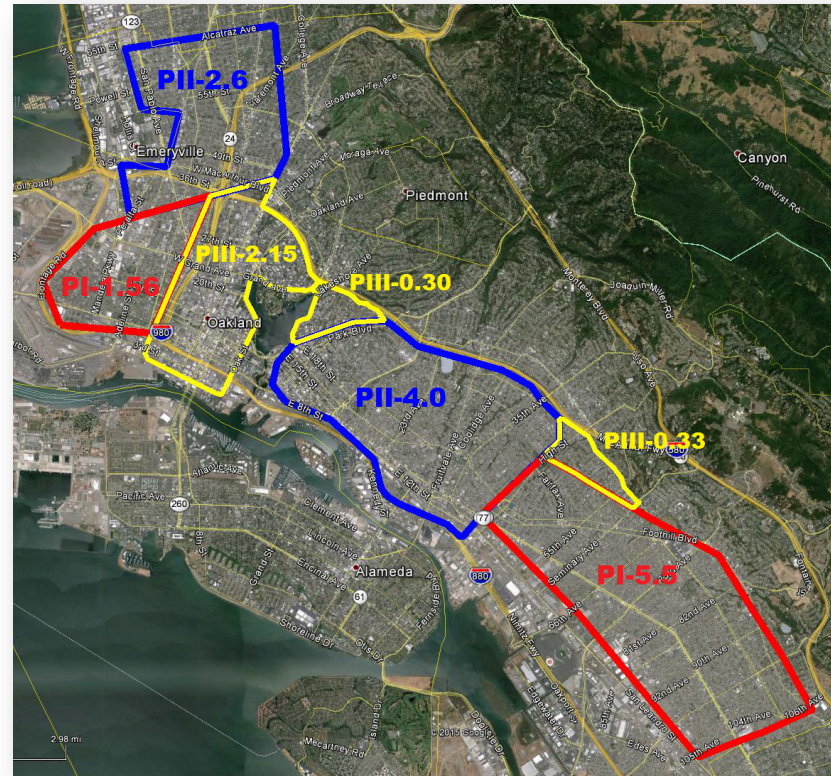


Source: Cooper University Hospital Study Sept. 2018

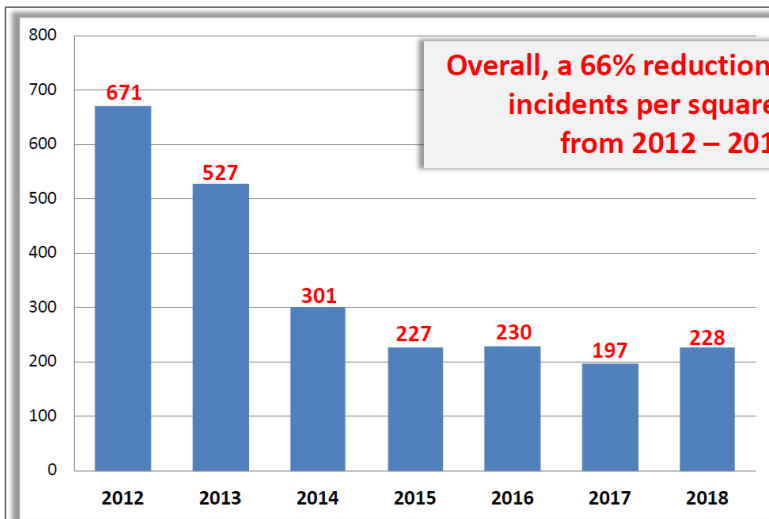
Oakland and ShotSpotter

ShotSpotter Coverage Area in Oakland

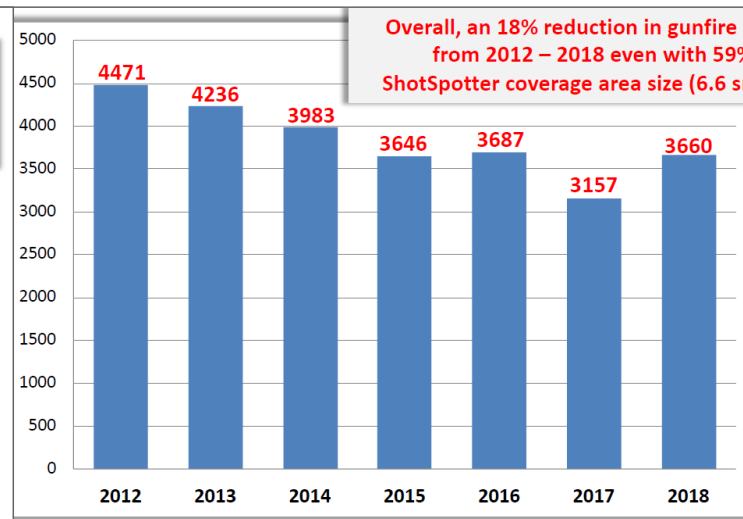
- 16 square miles
- Phase I Go Live:
October 12, 2011
- Phase II Go Live:
April 19, 2013
- Phase III Go Live:
September 26, 2016



Oakland Gun Violence Results



Overall, a 66% reduction in gunfire incidents per square mile from 2012 – 2018



Overall, an 18% reduction in gunfire incident volume from 2012 – 2018 even with 59% growth in ShotSpotter coverage area size (6.6 sm² to 16.04 sm²)

ShotSpotter Community Privacy Protections

Community Privacy Protections

- ShotSpotter has developed its technology and policies to enhance public safety while respecting individual privacy. The company is able to limit the risk of audio surveillance through technology along with strict controls and policies that have evolved over the years.
- Commissioned independent firm to conduct a privacy audit assessment and learn what we can do to better protect and communicate privacy
- Increasing our transparency about how the system works

COMPANY CONFIDENTIAL

Community Privacy Protections: Prior to System Activation

- When ShotSpotter comes to a new city, we strongly encourage our police agency customers to engage with their communities about the decisions to acquire and use our technology.
- Using a data-driven approach, ShotSpotter works with our clients to determine the geographic area they want covered by ShotSpotter (i.e. the most gun violent areas)
- When the coverage area is set, ShotSpotter engineers determine where to place sensors so as to allow even gunshot detection throughout the area. Police do not determine where to place sensors and do not have access to a database of sensor locations.
- ShotSpotter acoustic sensors are not positioned, tuned or specialized to pick up human voices. The sensors use ordinary microphones that are similar to ones found in cellphones and are placed high above the street.

Community Privacy Protections: Before and During an Incident

- Sensors “listen” for gunshot-like sounds and trigger only when detecting an impulsive sound (instantaneous and sharp). When at least three different sensors detect a gunshot-like sound at the same time and determine a location, they send a short audio snippet to ShotSpotter headquarters.
- Human voices will never trigger a sensor because they do not produce an instantaneous sharp sound and they are not loud enough to be picked up by three or more sensors.
- Live streaming of sensor audio is not possible by company employees, police or third parties.

Community Privacy Protections: Before and During an Incident

- Upon detecting a likely gunshot, trained ShotSpotter personnel listen to a short computer-generated audio snippet of the gunfire to double check that it is actually gunfire.
- It is highly unusual for a human voice to be included in a snippet. For this to occur, the voice must be concurrent with the gunfire. There is no personally identifiable information in any ShotSpotter audio snippet.
- If a snippet is determined to be gunfire, police are notified and provided with an audio snippet of the gunfire from the closest sensor to better help them understand # of shooters, caliber and type of weapon.

Community Privacy Protections: After an Incident

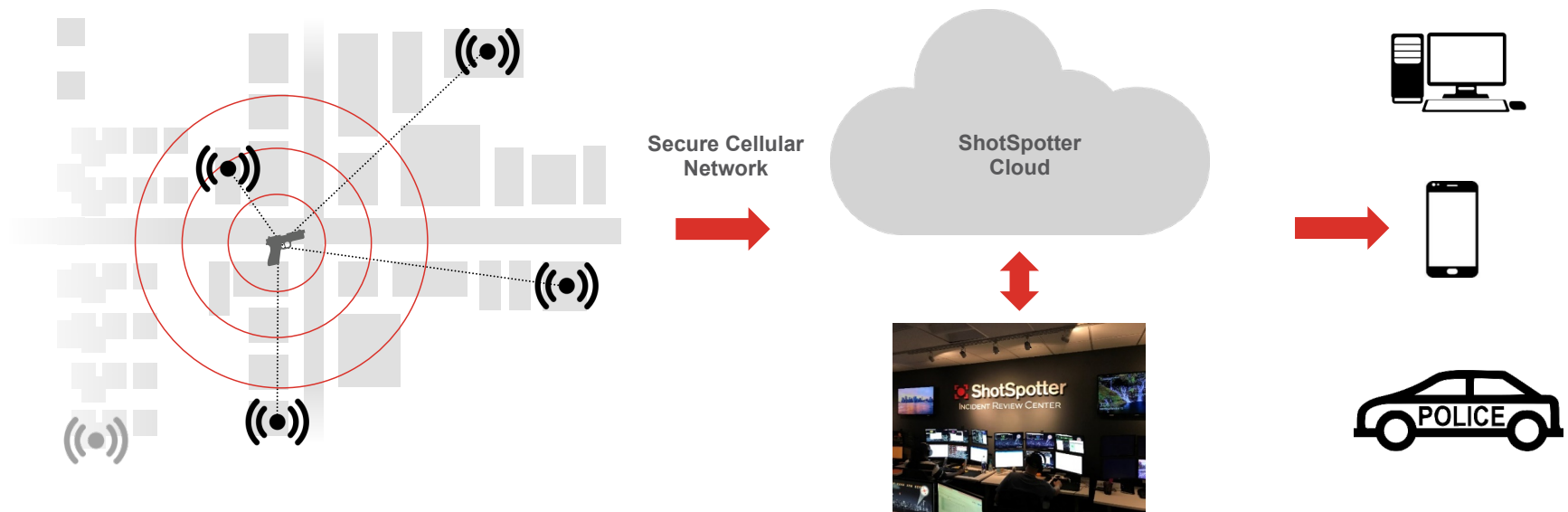
- The company made changes to the system in the early 2010s to prevent police and employee access to extended audio.
- If ShotSpotter receives a request (including a subpoena) for additional audio beyond the gunshot snippet, the company has and will continue to fight the request.
- Sensors store 72 hours of audio and automatically delete audio older than 72 hours. Neither police nor third parties ever have direct access to this audio. The company is reducing this to 30 hours in July 2019.

Community Privacy Protections: After an Incident

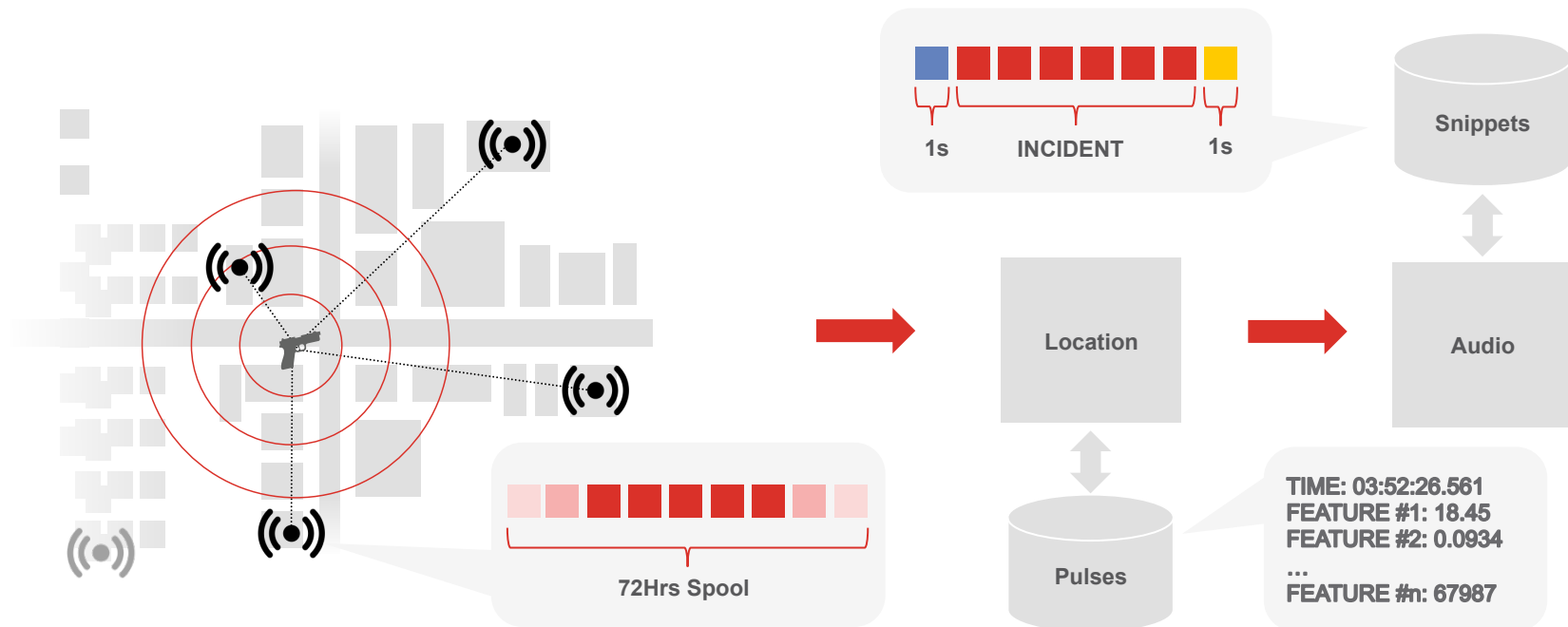
- Occasionally, police contact ShotSpotter because a gunshot incident was not picked up by our sensors. Authorized ShotSpotter personnel can access the audio database ONLY if presented with hard evidence of a gunshot incident. The search begins with a look for visual cues of an incident. If found, a short audio snippet is downloaded from the sensor and provided to police.
- ShotSpotter never modifies audio in any way.

Technical Details of ShotSpotter Community Privacy Protections

Technology: Real-Time Operating Model



Technology: Data We Store



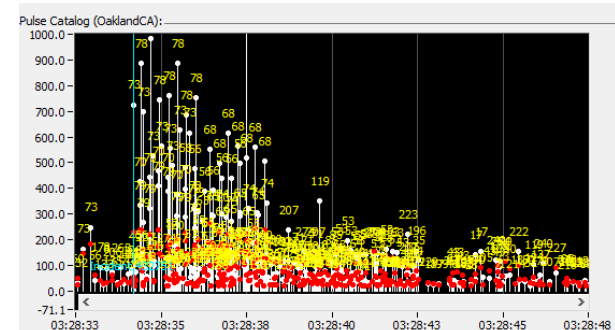
Technology: Post-Incident Operating Model

Post incident, we may receive evidence from the PD that we missed or mis-located an incident; using authorized forensic analyst, we may be able to improve on the real-time results

Analyst Techniques:

- Search the pulse database and look for visual evidence that impulsive events were missed
- An audio snippet can be retrieved from the sensors that heard the impulsive event if it is still within the spool file
- Calculate a more accurate location by selecting pulses from sensors further from the incident
- Resolve fine timing errors by examining the waveform and looking for the start of the gunshot

BROWSING PULSES



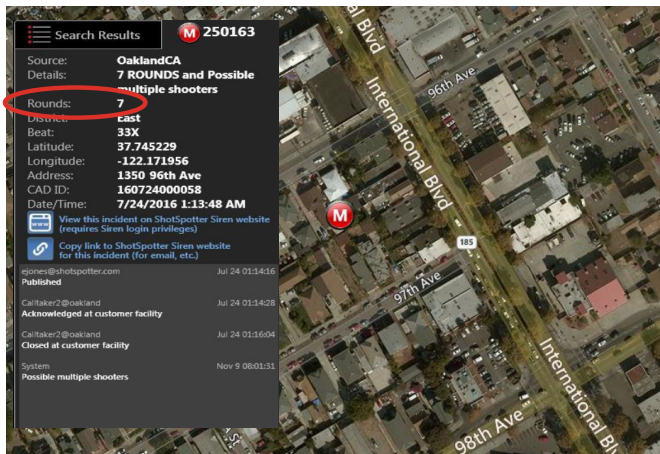
POST-INCIDENT SNIPPET POLICY



Technology: Detailed Forensic Report Example

ALERT – July 24, 2016

Real-time



DFR – November 9, 2016

Post-Incident

After analysis, the shot count was corrected to 10 rounds.

Shot	Time
1	01:13:46.637
2	01:13:49.139
3	01:13:49.427
4	01:13:49.688
5	01:13:49.812
6	01:13:49.935
7	01:13:50.103
8	01:13:50.183
9	01:13:50.326
10	01:13:50.575

Table 1 – Shot timeline, Flex ID #250163

Independent Privacy Audit

- **Policing Project at NYU Law School** (www.PolicingProject.org) conducted independent review of privacy policies and procedures
- Found **low risk** of primary privacy issue: **audio surveillance**
 - “SST’s strict control of the technology and data minimizes the chance it will be used for voice surveillance.”
- SST adopting Policing Project’s detailed **recommendations** to further minimize any risk:
 - Reduce audio spool from 72 hours to less than 48 hours;
 - Minimize length of audio snippets;
 - Strengthen internal access procedures; and more....
- Policing Project’s **full report** available Summer 2019



ACLU Opinion



“...gunshot detection in a city does not implicate any significant privacy interests... I am not losing sleep over this technology at this time.”

Jay Stanley, Senior Policy Analyst,
ACLU Speech, Privacy, and
Technology Project, May 5, 2015,
www.aclu.org



DETECT



PROTECT



CONNECT

Thank you!

